

CLAIMS

1. A chemical mechanical polishing system, comprising:

a polishing pad configured to move from a first point to a second point;

a carrier being configured to hold a substrate to be polished over the polishing
5 pad, the carrier being designed to apply the substrate to the polishing pad in a polish
location that is between the first point and the second point;

a first sensor located at the first point and oriented so as to sense an IN
temperature of the polishing pad;

a second sensor located at the second point and oriented so as to sense an OUT
10 temperature of the polishing pad.

2. A chemical mechanical polishing system as recited in claim 1, wherein
a temperature differential between the OUT temperature and the IN temperature is
monitored during polishing of the substrate.

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3. A chemical mechanical polishing system as recited in claim 2, wherein
a change in temperature differential indicates a change in material being polished from
the substrate.

20 4. A chemical mechanical polishing system as recited in claim 1, further
comprising:

an end-point signal processor, the end point signal processor being configured to receive sensing signals from each of the first and the second sensors.

5 5. A chemical mechanical polishing system as recited in claim 4, wherein the received signals are processed to monitor a temperature differential between the OUT temperature and the IN temperature during polishing of the substrate.

6. A chemical mechanical polishing system as recited in claim 4, wherein a change in the temperature differential signals a change in material being polished
10 from the substrate.

7. A chemical mechanical polishing system as recited in claim 1, wherein the first and second sensors are each infrared sensors.

15 8. A chemical mechanical polishing system as recited in claim 1, wherein the first and second sensors are arranged at a separation distance of between about 1 mm and about 250 mm from the polishing pad.

9. A chemical mechanical polishing system as recited in claim 4, wherein
20 the end-point signal processor further comprises:

a multi-channel digitizing circuit, the multi-channel digitizing circuit being configured to process the sensing signals from the first and second sensors.

10. A chemical mechanical polishing system as recited in claim 9, further comprising:

5 a graphical user interface (GUI) display being connected to the end-point processor, the GUI display being configured to illustrate end-point monitoring conditions.

11. A chemical mechanical polishing system as recited in claim 1, further comprising:

10 an array of sensor pairs, the array of sensor pairs including the first sensor and the second sensor, each pair of the array of sensor pairs being arranged so as to sense temperature differentials associated with two or more zones of the substrate that is to be polished.

15 12. A chemical mechanical polishing system as recited in claim 1, wherein the substrate is one of a semiconductor wafer and a data storage disk.

13. An apparatus, comprising:

a polishing pad configured to move from a first point to a second point;

20 a carrier being configured to hold a substrate, the carrier being designed to apply the substrate to the polishing pad in a polish location that is at least partially between the first point and the second point;

a first sensor located near the first point and oriented so as to sense an incoming temperature of the polishing pad;

a second sensor located near the second point and oriented so as to sense an outgoing temperature of the polishing pad.

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14. An apparatus as recited in claim 13, wherein the incoming temperature of the polishing pad is the temperature of the polishing pad before moving to the polish location and the outgoing temperature of the polishing pad is the temperature of the polishing pad after moving out from the polish location.

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15. An apparatus, comprising:

a polishing pad configured to traverse from at least a first point to a second point;

a first sensor located near the first point and oriented so as to sense an incoming temperature of the polishing pad;

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a second sensor located near the second point and oriented so as to sense an outgoing temperature of the polishing pad, wherein a difference between the incoming temperature and the outgoing temperature is used to determine endpoint of a polishing operation.

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16. An apparatus as recited in claim 15, wherein the polishing pad is one a belt pad, a table pad, a rotary pad, and an orbital pad.